DOCUMENT RESUME

ED 255 535 TM 840 788

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TITLE An Inventory Approach to Assessing the Learning Styles of College Students: Continued Exploration.
PUB DATE 5 Oct 84
NOTE 20p.; For a related document, see ED 241 559. Paper presented at the Annual Meeting of the Northern Rocky Mountain Educational Research Association (2nd, Jackson Hole, WY, October 4-6, 1984).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Attitude Measures; *Cognitive Style; *College Students; Educational Psychology; Grade Point Average; Higher Education; Learning Strategies; Sex Differences; Student Attitudes; *Teaching Methods; *Test Reliability; Test Validity
IDENTIFIERS Learning Style Inventory (Renzulli and Smith)

ABSTRACT

This paper reports on a replication of a 1983 study investigating whether the Renzulli/Smith Learning Style Inventory (RSLSI) can identify the learning style differences of college undergraduates. The 65 item RSLSI assesses children's preferred learning styles in nine areas: projects, simulations, drill and recitation, peer teaching, discussion, teaching games, independent study, programmed instruction, and lecture. Administered to 150 sophomore and junior educational psychology students, RSLSI data were analyzed for reliability and for relationship with the independent variables sex and self-reported grade point average (GPA). Results indicate overall patterns consistent with the 1983 study findings: (1) females prefer to engage in more independent, individual learning activities and discussions than males; (2) high GPA students prefer lecture and peer teaching; and (3) low GPA students prefer lecture, teaching games, and peer teachings. Both high and low GPA students in the 1984 study showed a significant increase in preference for discussion and simulation over the 1983 population. Overall similarities support the utility of the RSLSI for assessing the learning preferences of college students. (BS)

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AN INVENTORY APPROACH TO ASSESSING THE LEARNING STYLES OF COLLEGE STUDENTS: CONTINUED EXPLORATION

A Paper Presented At The
Northern Rocky Mountain Educational
Research Association Annual Meeting

October 5, 1984

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TM 840 788

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During the Fall semester of the 1982-83 academic year, research was undertaken at South Dakota State University to discover whether existing instrumentation was capable of identifying learning style differences within and among college sophomore and junior students (Ristow and Edeburn, 1983). The Renzulli/Smith Learning Style Inventory was selected as the instrument for measuring responses (Renzulli/Smith, 1978). This inventory focuses on teaching methodology rather than learning processes and thus was viewed as most adequately meeting the authors' intention for a practical instrument with direct classroom application.

The preliminary findings of the 1982 study indicated significant preferences relative to student's sex and grade point averages (Ristow and Edeburn, 1983). Using a population of 115 sophomore and junior college students enrolled in an Educational Psychology class, the authors noted High Preference areas for the subscales of Peer Teaching, Discussion, Teaching Games, Programmed Instruction and Lecture while low preference areas involved Simulation and Independent Study.

The results of this study showed a need for continued research in this area in order to support the findings.

During the Fall semester of 1983 and the Spring semester of 1984, the previous study was replicated on two groups of Educational Psychology students at SDSU.

Methodology

The Renzulli/Smith Learning Style Inventory (RSLSI) was administered to 153 sophomore/junior level students enrolled in Educational Psychology during the Fall of 1983 and Spring of 1984.

An analysis was conducted comparing the independent variables of sex and self-reported GPA.

Instrumentation

The RSLSI was developed to assess the learning styles of children relative to nine areas including: (a) Projects, (b) Simulations, (c) Drill and Recitation, (d) Peer Teaching, (e) Discussion, (f) Teaching Games, (g) Independent Study, (h) Programmed Instruction, and (i) Lecture. The instrument consists of 65 items which were developed to assess student preference in one or more of these nine areas. Content validity was determined by a group of 23 expert judges (Renzulli/Smith, 1978). Construct validity was based on answers secured from 700 seventh and eighth grade students and submitted to an oblique rotation analysis (Hoffman, 1970) by area. Using the Spearman-Brown formula reliability was established and showed a range of .66 to .77 across the nine areas. In the present study, internal consistency reliability coefficients ranged from .67 to .82 on the nine subscales, with an overall reliability of .90. A summary of the instrument reliability analysis was presented in Table 1.

Table 1

SUMMARY OF INSTRUMENT
RELIABILITY ANALYSIS (RSLSI)

Subscale	Mean	Number Of Items	Average Item Mean	Internal Consistency Coefficient
Projects	28.53	9	3.20	.82
Simulations	18.67	6	3.12	.76
Drill and Recitations	24.91	8	3.14	.77
Peer Teaching	22.10	6	3.73	.78
Discussion	28.76	8	3.64	.79
Teaching Games	18.71	5	3.76	.75
Independent Study	25.80	9	2.88	.80
Programmed Instruction	25.96	7	3.72	.67
Lecture	26.60	7	3.81	.72
Overall	220.04	65	3.39	.90

Results

Scoring instructions established by the instrument authors indicate that average item means (for each subscale) be used to identify two categories as follows:

1. Less than 2.5 = Low Preference
2. Greater than 3.0 = High Preference

In the 1982-83 study this procedure was modified to more precisely identify the "High Preference" categories by raising this criterion to a mean of > 3.49, or 3.5 and higher. This adjustment was maintained in the 1983-84 study.

In conjunction with overall results selected demographic (independent) variables were used to determine whether or not learning preference differences were evidenced. These independent variables included the following:

1. Sex of the respondent.
2. Self-reported Grade Point Average (GPA).

The results of these analyses were reported in Tables 2-5.

Overall Response

Table 2 was used to show a breakdown of overall results by subscale. It should be noted that the middle or "neutral" response percentages were also reported in the table. The mean responses are shown with the 1983 study results in the left hand column and the 1984 results in the right hand column of each category. While the High Preferences for the 1984 study fell in the subscales of Peer Teaching (60.1%), Discussion (68.6%), Teaching Games (60.1%), and

Table 2
SUMMARY OF PREFERENCE CATEGORIES
(OVERALL) BY SUBSCALE

(N = 153)

Subscale	% Low Preference		% Neutral		% High Preference	
	1983	1984	1983	1984	1983	1984
Projects	11.8	20.3	60.0	51.0	28.2	28.8
Simulations	21.8	13.7	52.7	47.7	25.5	38.6
Drills and Recitation	19.1	20.3	56.4	69.9	24.5	9.8
Peer Teaching	1.8	2.6	32.7	37.3	65.5	60.1
Discussion	1.8	2.0	37.3	29.4	60.9	68.6
Teaching Games	5.1	7.2	26.4	32.7	68.2	60.1
Independent Study	24.5	20.3	61.8	54.9	13.6	24.8
Programmed Instruction	0.9	8.5	31.8	65.4	67.3	26.1
Lecture	0.9	1.3	26.4	26.8	72.7	71.3

Lecture (71.9%). The overall pattern remained consistent from each study. The only obvious difference between the two groups is in the area of Programmed Instruction. Perhaps, this particular subscale needs further exploration relative to its usefulness as a measure of college students' preferences. More students in the 1984 study found this subscale to be a neutral choice. Again, this may be indicative of a problem with using this as a measure of learning preferences in college students or, perhaps it is simply indicative of the differing experiences of the 1984 group towards Programmed Instruction.

Low Preference subscales were again less substantial than that of the High Preference percentages and were consistent with the previous study.

Comparison by Sex

The comparison of sex of the respondent supports the continuation that there was little difference in patterns from the 1983 to the 1984 study. While the percentages changed somewhat in terms of spread between male and female student preferences, the high preference and low preference subscales remained at essentially the same level.

Table 3 presents an analysis of the responses by sex. Again, the 1983 study data can be found in the left hand column while the 1984 data is reported in the right hand column. As can be noted, the population of the 1984 study consisted of 98 females and 55 males. In comparison to the 1983 study this results in a spread gain of 13 females. As in the previous study, the high preferences were generally maintained by both sexes and the female responses were larger for all four cases with 64.3/52.7, 78.6/50.9, 61.2/58.2 and 78.6/60.0%

Table 3
SUMMARY TABLE OF PREFERENCE CATEGORIES
BY SEX BY SUBSCALE
N=98 Females, N=55 Males

Subscale	Low Preference				Neutral				High Preference			
	% Female		% Male		% Female		% Male		% Female		% Male	
	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Projects	7.1	20.4	20.0	20.0	60.0	44.9	60.0	61.8	32.9	34.7	20.0	18.2
Simulations	20.0	15.3	25.0	10.9	57.1	43.9	45.0	54.5	22.9	40.8	30.0	34.5
Drill and Recitation	18.6	20.4	20.0	20.0	57.1	68.4	55.0	72.7	24.3	11.2	25.0	7.3
Peer Teaching	2.9	1.0	0.0	5.5	25.7	34.7	45.0	41.8	71.4	64.3	55.0	52.7
Discussion	1.4	2.0	2.5	1.8	32.9	19.4	4.0	47.3	65.7	78.6	52.5	50.9
Teaching Games	5.7	6.1	5.0	9.1	14.3	32.7	47.5	32.7	80.0	61.2	47.5	58.2
Independent Study	21.4	19.4	30.1	21.8	62.9	51.0	60.0	61.8	15.7	29.6	10.0	16.4
Programmed Instruction	1.4	6.1	0.0	12.7	22.9	62.2	47.5	70.9	75.7	31.6	52.5	16.4
Lecture	1.4	1.0	0.0	1.8	18.6	20.4	40.0	38.2	80.0	78.6	60.0	60.0

respectively. The greatest differences were noted in the Discussion subscale (78.6/50.9).

The low preference means were highly similiar to the 1983 study.

GPA

When comparing the self-reported grade point average (GPA) to each of the subscales, the same four-point GPA schedule used in the 1983 study was employed:

1. 4.00 - 3.50 (N = 27)
2. 3.49 - 3.00 (N = 46)
3. 2.99 - 2.50 (N = 50)
4. 2.49 and below (N = 30)

Tables 4 and 5 were used to cross-tabulate the High Preference and Low Preference response percentages by GPA. The patterns for overall preference by GPA were consistent with the 1983 study with the exception of Programmed Instruction. High GPA students (3.5 - 4.0) perferred Lecture and Peer Teaching in both studies. However, the 1984 respondent had significant preference differences in the Discussion subscale. While the percentages were higher for the lower GPA students (2.49 and below) on individual subscales, the overall pattern of preferences held true. Lower GPA students tended to prefer Peer Teaching, Discussion, Teaching Games and Lecture.

A view of Table 5 finds the overall pattern for non-preferences again holding true from the 1983 results to the present study results. The major subscale differences among the High GPA students can be found in Projects (16.7% to 33.3%), Simulations (38.9% to 7.4%), Drill and Recitation (5.6% to 22.2%), and Programmed Instruction (0.0% to 14.8%).

Table 4
SUMMARY OF HIGH PREFERENCE
CATEGORIES BY G.P.A.

Subscale	N= 27 4.00-3.50		N=46 3.49-3.00		N= 50 2.99-2.50		N=30 2.49 & below		N= 153 Overall	
%	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Projects	22.2	22.2	26.9	21.3	40.0	34.6	9.5	36.7	28.2	28.8
Simulations	22.2	48.1	23.1	31.9	31.1	32.7	19.0	50.0	25.5	38.5
Drill & Recitation	38.9	3.7	26.9	14.9	22.2	5.8	14.3	13.3	24.5	9.6
Peer Teaching	66.7	55.6	61.5	48.9	75.6	67.3	47.6	66.7	65.5	59.6
Discussion	44.4	88.9	69.2	61.7	73.3	69.2	38.1	60.0	60.9	68.6
Teaching Games	72.2	51.9	69.2	57.4	75.6	67.3	47.6	63.3	68.2	60.9
Independent Study	22.2	44.4	23.1	31.9	11.1	13.5	0.0	16.7	13.6	25.0
Programmed Inst.	77.8	33.3	76.9	27.7	71.1	28.8	38.1	10.0	67.3	25.6
Lecture	88.3	70.4	92.3	74.5	66 7	69.2	52.4	73.3	72.7	71.8

Table 5
SUMMARY OF LOW PREFERENCE
CATEGORIES BY G.P.A.

Subscale	N=27 4.00-3.50		N= 46 3.49-3.00		N=50 2.99-2.50		N=30 2.49 & below		N=153 Overall	
	% 1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Projects	16.7	33.3	3.8	27.7	15.6	11.5	9.5	13.3	11.8	20.5
Simulations	38.9	7.4	19.2	17.0	17.8	13.5	19.0	16.7	21.8	14.1
Drill & Recitations	5.6	22.2	23.1	19.1	24.4	25.0	14.3	16.7	19.1	21.2
Peer Teaching	5.6	7.4	3.8	0.0	0.0	0.0	0.0	6.7	1.8	2.6
Discussion	0.0	0.0	0.0	2.1	4.4	0.0	0.0	6.7	1.8	1.9
Teaching Games	0.0	7.4	3.8	6.4	4.4	3.8	14.3	13.3	5.1	7.1
Independent Study	22.2	18.5	11.5	19.1	24.4	21.2	42.9	26.7	24.5	21.2
Programmed Inst.	0.0	14.8	0.0	4.3	2.2	5.8	0.0	13.3	0.9	8.3
Lecture	0.0	0.0	0.0	2.1	0.0	0.0	4.8	3.3	0.9	1.3

These non-preferences were, however, still consistent with the overall group non-preferences except for the subscales of Simulations and Programmed Instruction.

The lower GPA students (2.49 and below) responses showed a pattern similiar to the 1983 group with the exception of Independent Study. Less 1984 respondents had a non-preference for this subscale than the 1983 respondents (26.7% to 42.9%).

Discussion

While variances did exist between the two groups, the overall patterns remained consistent from the 1982 group to the 1984 group. This would seem to uphold the authors' initial premise that the RSLSI has some reliability for college use.

The results in this analysis would seem to add further evidence to the hypothesis that females prefer to engage in more independent, individual learning activities and discussions than males.

As with the previous two areas discussed, the overall patterns, when analyzing GPA, remain consistent from study to study. High GPA students (3.5 - 4.0) preferred Lecture and Peer Teaching in both studies. Low GPA students (2.49 and below) had the same top three preferences of Lecture, Teaching Games and Peer Teaching. The differences centered around Discussion, with both high and low GPA students indicating a preference for this method in the 1984 study, and Simulations, where both groups again showed a significant increase in preference for this area.

It would seem that the low GPA group in the 1984 study were much more likely to have learning preferences than the 1983 group. One must

keep in mind that the very nature of learning styles will cause a predictable change in the results of an inventory from one group to another. Learning styles are individual and cannot be expected to hold highly consistent when the populations change. The obvious implications here are not so much of the finite differences between the two groups relative to individual subscales but in the overall patterns and similarities between the groups as shown. These patterns show a consistent relationship from the 1983 study group to the 1984 study group in all GPA groups as well as overall.

This same relationship is upheld in the low preference group by GPA. The overall pattern shows a consistent trend with Independent Study being the lowest preferred (24.5% in 1983 to 21.2% in 1984) and Drill and Recitation and Simulations flip-flopping from second lowest preferred (Drill and Recitation yielded at 19.1% in 1983 and a 21.2% in 1984, while Simulations yielded a 21.8% in 1983 and a 14.1% in 1984) to third lowest preferred.

The low preference area, probably more than the others, yields some significant trend differences among high GPA respondents. The 1984 high GPA respondents seemed to not prefer more subscales than the 1983 group. While none of the low preferences had high enough percentages to be significant (as with the 1983 group), the 1984 group did indicate non-preferences for Projects (33.3%), Drill and Recitation (22.2%), and Programmed Instruction (14.8%) over the 1983 group (16.7%, 5.6% and 0.0% respectively). This trend was not upheld when the lower GPA group was analyzed for their non-preference responses. The trend for the lower GPA group was almost identical to the 1983 group with the

exception of Programmed Instruction. Again, one would expect to see some variance from population to population relative to subscales. However, the general patterns that have emerged would seem to be the significant data to explore.

Perhaps the GPA is not a good predictor of learning preferences. Stewart (1981) has indicated that extremely bright children have different learning styles than average children. While this may be true with school age children, although there seems to be some evidence to repudiate this (Ristow, Ristow and Edeburn in progress), it may not hold true with older learners.

While various aspects of this study provide for some interesting starting points for discussion, the bottom line still remains. The general patterns, overall, by sex and by GPA, hold true from the 1983 population studied to the 1984 population studied. This fact had led these authors to conclude that the RSLSI offers a viable core instrument for assessing the learning preferences of college students.

Recommendations for Future Study

This particular study has shown that one can measure the learning preferences of college sophomores and juniors. It has also generated several other recommendations that could prove valuable for future study.

After assessing the learning preferences one could develop a curriculum that would focus on the subscales most preferred by the students. An experimental design could then be developed to test the success of matching curriculum/methodology to learning preference.

The variances found within the subscales could perhaps indicate instrumentation weakness when assessing college students. This might

especially be true with the Programmed Instruction subscale. Further exploration into which subscale would prove most valuable may be in order.

The utilization of item analysis to attempt to discover which items may be influencing the instrument results may also prove valuable.

REFERENCES CITED

Hoffman, R. J. The Oblique Fran Formation. Unpublished Doctoral Dissertation. State University of New York at Albany, 1970.

Renzulli, Joseph S. and Smith, Linda H. Learning Styles Inventory: A Measure of Student Preferences for Instructional Techniques. Creative Learning Press, Mansfield, Connecticutt, 1978.

Ristow, Gwen L.; Ristow, Robert S. and Edeburn, Carl E. "Learning Preferences: A Comparison of Gifted and Average Middle-Grade Students in Small Schools". (In progress.)

Ristow, Robert S. and Edeburn, Carl E. "An Inventory Approach to Assessing the Learning Styles of College Students". Paper Presented at the Northern Rocky Mountain Educational Research Association Annual Meeting, October 15, 1983.

Stewart, Emily D. "Learning Styles Among Gifted, Talented Students: Instructional Technique Preferences". Exceptional Child, 1981, pp. 134-138.